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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/394,189	Underbrink et al
Examiner	**Art Unit**
Charles Craver	2681

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Apr 2, 2001*

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 22-30* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideratio

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12, 22-28, and 30* is/are rejected.

7)☒ Claim(s) *29* is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some* c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)

16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18)☐ Interview Summary (PTO-413) Paper No(s). _____

19)☐ Notice of Informal Patent Application (PTO-152)

20)☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

2. Claim 7 recites the limitation stating that the antenna of claim 1 is impedance matched to the amplifier, which is previously recited in claim 1, lines 5-6.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 27 is rejected under 35 U.S.C. 102(b) as being anticipated by Filimon.

Regarding claim 27,

Filimon discloses a method for wireless communication, comprising

adjusting the impedance of a patch antenna for use in a wireless device so as to match it with that of a system for transmission, inherently comprising an amplifier (col 4 line 46-col 5 line 1), wherein the step of tuning of the antenna so as to match the amplifier would inherently comprise determining the impedance of said amplifier.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-4, 6-8, 11, 12 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuru in view of Filimon et al.

Regarding claims 1 and 7,

Tsuru discloses a hand-held communications device (1),

an antenna (3) coupled to the device (col 3 lines 32-56), the antenna configured so as to radiate with greater field intensity over an area of less than 360 degrees of arc (col 3 line 57-col 4 line 20, see FIG 11),

inherently, a transmitter amplifier, and

wherein the portion of the field that is of greater intensity is in the direction away from the head of the user of the device (col 1 lines 52-59, col 2 lines 13-24).

Tsuru does not specifically disclose that the transmitter and antenna impedances are matched.

Filimon discloses that it is useful in a hand-held communication device (101) with an antenna (200), to match the impedance of the antenna to the transmitter (inherently comprising an amplifier, col 3 lines 28-33 and 46-57, col 4 lines 56-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Tsuru, as matching the impedance of the transmitter and antenna provides for more efficient operation and sensitivity.

Regarding claim 2,

since Tsuru teaches a radiotelephone, which typically operates on a single channel, or narrow band, it is inherent that a signal radiated from the device would be within a narrow and predetermined band.

Regarding claim 3 and 4,

Filimon further discloses that it is useful to provide a loop antenna (col 1 lines 53-56), or a patch antenna (col 2 lines 41-46).

Regarding claim 6,

Tsuru further discloses that it is useful to couple a receive antenna (col 5 lines 51-55) to the hand-held device.

Regarding claim 8,

Tsuru discloses a hand-held wireless cellular communications device (1,), and

a transmit antenna (33) and a receive antenna (34) coupled to the device (col 2 lines 3-12 and col 5 lines 25-55), and, inherently a transmitter amplifier.

Tsuru does not specifically disclose that the transmitter and antenna impedances are matched.

Filimon discloses that it is useful in a hand-held communication device (101) with an antenna (200), to match the impedance of the antenna to the transmitter (inherently comprising an amplifier, col 3 lines 28-33 and 46-57, col 4 lines 56-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Tsuru, as matching the impedance of the transmitter and antenna provides for more efficient operation and sensitivity.

Regarding claim 11,

Filimon further discloses that it is useful in a hand-held communication device (101) with an antenna (200), to provide a patch antenna (col 2 lines 41-46), which would be contained within the housing of the unit.

Regarding claim 12,

while Filimon discloses that a patch antenna may comprise a piece of copper foil mounted to the inside of the device, Filimon further teaches that the patch antenna may be a conductive coating applied directly to a panel (col 3 line 64-col 4 line 2 and lines 43-47). This would obviously motivate one of ordinary skill in the art to enclose such antennae in an IC package,

especially given the suggestion of a conductive coating, as an IC package would reduce production costs by eliminating extra components.

Regarding claim 22,

Tsuru discloses a method for use in a hand-held communications device (1), comprising modulating speech data onto a signal,

transmitting the signal, inherently from a transmitter amplifier, from an antenna (3) coupled to the device (col 3 lines 32-56), the antenna configured so as to radiate with greater field intensity over an area of less than 360 degrees of arc (col 3 line 57-col 4 line 20, see FIG 11),

wherein the portion of the field that is of greater intensity is in the direction away from the head of the user of the device (col 1 lines 52-59, col 2 lines 13-24).

Tsuru does not specifically disclose that the transmitter and antenna impedances are matched.

Filimon discloses that it is useful in a hand-held communication device (101) with an antenna (200), to match the impedance of the antenna to the transmitter (inherently comprising an amplifier, col 3 lines 28-33 and 46-57, col 4 lines 56-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Tsuru, as matching the impedance of the transmitter and antenna provides for more efficient operation and sensitivity.

Regarding claim 23,

Filimon discloses receiving an incoming signal at a second antenna (col 3 lines 28-63).

Regarding claim 24,

Filimon further discloses that it is useful in a hand-held communication device (101) with an antenna (200), to provide a patch antenna (col 2 lines 41-46), which would be contained within the housing of the unit.

Regarding claim 25,

Filimon further discloses receiving signals with the patch antenna (col 3 lines 58-63, col 4 lines 56-65).

Regarding claim 26,

Filimon further teaches a monopole antenna for receiving signals (col 3 lines 40-45).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuru and Filimon et al as applied to claim 1 above, and further in view of Flowerdew et al.

Tsuru in view of Filimon discloses applicant's invention of claim 1, and further states that it is useful to couple a receive antenna (col 5 lines 51-55) to the hand-held device. Tsuru does not disclose that the receive antenna has a filed of reception orthogonal to the field of reception of the transmit antenna.

Flowerdew discloses that it is useful in a hand-held device (104) comprising a transmit antenna (904) and a receive antenna (902) to provide the two antennas with mutually orthogonal fields of transmission/reception (col 8 lines 25-61).

Therefore, it would have been obvious to one skilled in the art to add such a function to Tsuru in view of Filimon, since Flowerdew states that orthogonal fields minimize mutual coupling (col 13 lines 36-48).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuru and Filimon et al as applied to claim 8 above.

Tsuru in view of Filimon discloses applicant's invention, but does not specifically disclose that the device is a cellular telephone.

However, given that Tsuru does disclose a portable radio communicator, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize such means in a cellular system, as antenna diversity is commonly used in cellular devices in order to provide a maximum amount of signal gain and clarity with a minimum amount of power used.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuru and Filimon as applied to claim 8 above, and further in view of Flowerdew.

Tsuru in view of Filimon discloses applicant's invention of claim 8, but does not disclose that the receive antenna has a filed of reception orthogonal to the field of reception of the transmit antenna.

Flowerdew discloses that it is useful in a hand-held device (104) comprising a transmit antenna (904) and a receive antenna (902) to provide the two antennas with mutually orthogonal fields of transmission/reception (col 8 lines 25-61).

Therefore, it would have been obvious to one skilled in the art to add such a function to Tsuru and Filimon, since Flowerdew states that orthogonal fields minimize mutual coupling (col 13 lines 36-48).

10. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Filimon.

As shown above, Filimon discloses applicant's invention of claim 27. While not disclosing that the amplifier system's impedance is specifically 10 ohms, it would have been obvious to one of ordinary skill in the art at the time of the invention that transmitter amplifiers with such characteristic impedances were available, and as such, such a value would have been the product of a routine engineering decision, that is, the choice of transmitter amplifier used in a particular embodiment of the invention.

11. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Filimon as applied to claim 27 above, and further in view of Naitou, newly cited.

While disclosing applicant's invention of claim 27 above, Filimon does not disclose that the adjustment may be operable to change the antenna pass band.

Naitou suggests that antennas may be adjusted so as to tune to a particular channel, i.e. change the passband characteristic of the antenna (col 1 lines 15-21), thus reducing the need for further filtering.

Given such a suggestion, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Filimon; Filimon teaches the utility of adjusting a patch antenna, while Naitou suggests adjustment of antenna passbands is preferable, and as such, adding such a feature to Filimon would provide better response and sensitivity.

Allowable Subject Matter

12. Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:

Claim 29 teaches towards a method for providing a patch antenna in a wireless device, comprising determining the impedance of a transmit antenna and adjusting the patch antenna to match the amplifier impedance, said step comprising performing a finite element analysis on a design of the patch antenna to determine an estimated output impedance, and adjusting the are of the antenna if the estimation does not match. Claim 27 presents a series of steps which are neither taught nor suggested by the prior art.

Response to Arguments

14. Applicant's arguments with respect to claims 1, 2 and 8 have been considered but are moot in view of the new ground(s) of rejection.

15. Applicant's arguments filed 4-2-01 with regards to claims 3, 4, 6 and 7 have been fully considered but they are not persuasive.

Regarding he combination of Tsuru and Filimon, it must be noted that the Filimon reference is used to show the utility of providing a patch and monopole antenna; the utility of providing an antenna with less than 360 degrees of arc of transmission is already taught by Tsuru. Further, the assertion that Filimon does not teach an adjustable matching patch antenna is wholly incorrect, see Filimon col 4 lines 56-65, where it is further taught that the patch antenna may both receive and transmit signals.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. **Any response to this final action should be mailed to:**

Box AF

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications; please mark "EXPEDITED PROCEDURE")

Or:

(703) 872-9314 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Craver whose telephone number is (703) 305-3965.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost, can be reached on (703) 305-4778.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700.

CC
C. Craver
June 15, 2001

NAY MAUNG
PRIMARY EXAMINER